DOCUMENT RESUME

ED 107 296 IR 002 045

TITLE	Bibliography: Computers in the Mathematics and Science Classroom.
INSTITUTION	Fremont Union High School District, Sunnyvale, Calif.
PUB DATE	Jun 75
NOTE	29p.
EDRS PRICE	MF-$0.76 HC-$1.95 PLUS POSTAGE
DESCRIPTORS	*Annotated Bibliographies; Audiovisual Aids; Computers; *Computer Science Education; Elementary Education; Games; Instructional Media; *Mathematics Instruction; Periodicals; Programing; *Science Instruction; *Secondary Education; Teacher Education

ABSTRACT

Intended primarily for teachers, this annotated bibliography lists materials available through various sources for use by the teacher in and out of the classroom. Subject headings under which entries are listed include: (1) professional materials, (2) periodicals, (3) learning to program, (4) mathematics; (5) science, (6) games, and (7) clubs. Both printed and audiovisual materials are listed. (DGC)

ED107296

BIBLIOGRAPHY: COMPUTERS IN THE MATHEMATICS AND SCIENCE CLASSROOM.

Fremont Union High School District

Sunnyvale, California

Mathematics and Science Center

June 1975

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MATHEMATICS AND SCIENCE CENTER

BIBLOGRAPHY:
COMPUTERS IN THE MATHEMATICS AND SCIENCE CLASSROOM

A. PROFESSIONAL MATERIALS

1. COLLEGE MANAGEMENT, October 1972, $2, 22 West Putnam, Greenwich, Connecticut, 06830.

   Theme of this issue is "Computers in the Curriculum", with ten major articles.

2. Conference Board of the Mathematical Sciences, RECOMMENDATIONS REGARDING COMPUTERS IN SECONDARY SCHOOLS. 2100 Pennsylvania Avenue, N.W., Suite 834, Washington, D.C. 20037. April 1972 free.

   A "must" on the reading list. Recommendations represent the culmination of a two-year study conducted by a special committee. Covers computer literacy; computer use in mathematics, science, and other courses; programs for gifted students, and training for inservice and preservice teachers.

3. J.E. Eisele, et.al., COMPUTER ASSISTED PLANNING OF CURRICULUM AND INSTRUCTION: How to Use Computer Based Resource Units to Individualize Instruction, Educational Technology Publications, Inc., 1971, $3.95.

4. Entelek, CAI, CMI, ABSTRACTS, Entelek, Inc. 42 Pleasant Street, Newburyport, Massachusetts, 01950, $15.

   Every 60 days subscribers receive 108 abstracts, bound in book form, but perforated for easy removal and filing. Abstracts are of significant books, articles or specifications of computer programs.

5. W. J. Koch, THE USE OF COMPUTERS IN INSTRUCTION IN SECONDARY SCHOOLS, National Association of Secondary School Principals, 1201 Sixteenth Street, N.W., Washington, D.C. 20036, 1972, $1.50.

   Good introduction, some indications of funding sources and a short glossary.

6. Walter Koetke, COMPUTERS IN THE CLASSROOM, Publisher unknown.

   Intended to serve as a handbook and reference for teachers. Specific suggestions are made as to where and how to use the computer within the school's present curriculum. Program examples are in FOCAL.

7. A.R. Molnar, COMPUTER INNOVATIONS IN EDUCATION, National Science Foundation, 1800 G Street, N.W., Washington, D.C. 20050, 1972.

8. Nuffield Foundation, COMPUTERS AND YOUNG CHILDREN, John Wiley, 1972. Good ideas on how to introduce computer concepts at the elementary level -- eggcrate computer, flowcharting, etc.

9. D.L. Post, ed., THE USE OF COMPUTERS IN SECONDARY SCHOOL MATHEMATICS, Entelek, 1970.

10. School Mathematics Project, COMMUNICATING WITH A COMPUTER, Cambridge University Press, $2.75 (paper), $4.95 (cloth).

    Aimed at teachers, but also very helpful for inexperienced but enterprising students from junior high up. Begins with a most useful, and quite uncommon, system for programming computations on an ordinary keyboard desk calculator.

11. School Mathematics Project, SOME EXPERIMENTAL IDEAS FOR TEACHERS, Cambridge University Press, $4.75 (paper) $10.50 (cloth)

    Lays down guidelines for teachers to consider, showing them how to introduce computing at an elementary level and warning of some of the difficulties they may encounter. There are plenty of examples, and problems are included at the end of each chapter.

12. B. W. Smith, ed. THE ROLE OF THE COMPUTER IN THE SECONDARY SCHOOL, Australian Computer Society, $6.

    Reflects recent development of computer capability, use in society, impact of society and potential. Illustrations are given of computer use in secondary school instruction, administration and student participation.

13. D.D. Spencer, A GUIDE TO TEACHING ABOUT COMPUTERS IN SECONDARY SCHOOLS, Abacus Computer Corporation, Suite 222, 110 E. Granada Avenue, Ormond Beach, Florida, 32074, $12.95.

14. University of Oregon, COMPUTERS IN EDUCATION RESOURCE HANDBOOK, Department of Computer Science, University of Oregon, Eugene, Oregon, 97403, $10.

    Sections include an overview, teaching about computers, computer literacy, computer programming, CAI, CMI, inservice training and many more. An excellent reference book.

15. P.G. Watson, USING THE COMPUTER IN EDUCATION, $3.95 (paper).

AUDIO VISUALS

16. HP Videotape, free. Carol Wilkinson, Data Systems Marketing, Hewlett-Packard Company, 11000 Wolfe Road, Cupertino, California, 95014.

    Shows use of computer in three different classroom situations. Three-fourth inch cassette or one-half inch reel.

17. MY COMPUTER UNDERSTANDS ME, color, 60 min., free. Mr. Steve Kallis, Film Library 6-B2, Digital Equipment Corporation, Maynard, Massachusetts,01754.

    Explores ways that the computer has strengthened thinking for students who have had the full power of computing made available to them. Statements are made concerning the effect of the computer on learning and the future directions of computers in education. Deals with ways that these learning improvements reveal themselves in the real school world of today.

18. PROJECT SOLO, color, 60 min., free. Mr. Steve Kallis, Film Library 6-B2, Digital Equipment Corporation, Maynard, Massachusetts, 01754.

    A documentary film which describes Project Solo, an experiment in regional computing in Secondary Schools. This film, which takes place right in the classroom, describes how this project uses the computer as a teaching tool. Students who have been intimately involved in the project comment on their experiences and the roles that the computer has played in their education.

AUDIO VISUALS

36. A COMPUTER GLOSSARY, 11 min./6mm/color/high school through adult. Contact IBM office for nearest IBM Film Library. An animated explanation of today's computer terminology-flowchart, Boolean logic, nanosecond, simulation, etc.

37. COMPUTERS AT WORK, 12 min/16mm/color/general audience.

    General Electric Educational Films, Corporations Park, Building 705, Scotia, New York, 12302, 1970. Shows the computer in roles other than a high speed business machine. Recommended for use in a general discussion of computers.

38. HOW COMPUTERS WORK, 6 filmstrips with records and guides/color. Encyclopedia Britannica Educational Corporation, 3712 Janis Avenue, Skokie, Illinois, 60076. High school through adult.

    The Computer System
    Software and Hardware at Work
    Number Systems: The Computer's Vocabulary
    Programming: How to Order a Computer Around
    Input/Output: How Computer's Read and Write
    The History of the Computer

39. THE INFORMATION MACHINE, 10 min./16mm/color/upper elementary through adult. Contact IBM office for nearest IBM Film Library. An animated file provides a clear account of the development of electronic computers.

40. SOME CALL IT SOFTWARE, 11 min./16mm/color/junior high through adult. Contact IBM office for nearest IBM Film Library.

    The film explains "software" as referring to the programs, flowcharts, and other documents and instructions that must be prepared to enable a computer to perform its task.

41. YOU AND THE COMPUTER, 9 min./16mm/color/general audience. General Electric Educational Films, Corporation Park, Building 705, Scotia, New York, 12303, 1969.

    Designed for the uninformed. Correlates the manner in which we solve problems and the way in which the computer solves them.

C. PERIODICALS

1. AEDS Monitor, monthly. Association of Educational Data Systems, 1201 16th Streets, NW, Washington, D.C. 20036.

   For those interested in learning more and keeping informed about current developments in educational data systems and computer technology.

2. AEDS Journal, quarterly. Association of Educational Data Systems,

   Comprehensive presentation of papers illustrating the latest developments in application of computer technology to all areas of education.

3. ASSOCIATION FOR DEVELOPMENT OF INSTRUCTIONAL SYSTEMS, mailing list, $6/yr. Helen A. Lekan, ADIS Secretary-Treasurer, c/o University of Wisconsin-Milwaukee, Computer and Management Services Division, Science Complex EB82, Milwaukee, Wisconsin, 53201.

   An international computer assisted instruction organization.

4. COMP RANDOMLY, published intermittently, comp. 3052 Warrington Road, Cleveland, Ohio, 44120. $.10 plus postage per issue.

5. COMPUTER DECISIONS, Hayden Publishing Company, 50 Essex Street, Rochelle Park, New Jersey, 07662. Free to "qualified individuals" working with computers.

6. COMPUTER EDUCATION, 3 issues/yr. Computer Education Information, Quay Street, Manchester M3 3HU England.

7. COMPUTER EDUCATION NEWS, bimonthly, Computer Education Information, Quay Street, Manchester M3 3HU England.

8. COMPUTERS AND PEOPLE, Berkeley Enterprises, 815 Washington Street, Newtonville, Massachusetts, 02160, $11.50/yr.

9. Recommended for people who care how computers will be used. COMPUTERS AND TEACHING (CAT), Northwestern University, 2003 Sheridan Road, Evanston, Illinois, 60201. Free to people who will share and participate.

10. COMPUTERWORLD, 797 Washington Street, Newton, Massachusetts, 02160, $.50/copy or $12/year., published weekly. An up-to-date report on what is happening in the world of computers. "The Wall Street Journal of the Computer Industry."

11. DATAMATION, bimonthly, $18/year Technical Publishing Company, 1301 South Grove Avenue, Barrington, Illinois, 60010. Articles for the computer systems manager and computer.

12. EDU, Digital Equipment Corporation, Maynard, Massachusetts, 01754. 4 issues/year/$2.

13. EDU HELP, DECUS, Digital Equipment Corporation, Maynard, Massachusetts, 01754.

    For users of DEC Edu systems.

14. ELECTRONICS, B.A. Hutchins, 60 Sheraton Drive, Ithaca, New York, 14850. 16 issues/year/$8. For those interested in the computer and/or electronic music.

15. FLYING BUFFALO'S FAVORITE MAGAZINE, P.O. 1467, Scottsdale, Arizona, 85252. 6 issues/year/$4.

16. GAMES AND PUZZLES MAGAZINE, Box 1176, Palo Alto, California, 94302. 12 issues/year/$9.

17. HP Educational User's Group NEWSLETTER, 8 issues/year, FREE, HP, c/o Ms. Carol Scheifle, 11000 Wolfe Road, Cupertino, California, 95014.

    Book reviews, problems, user articles, and information on what is new. This is YOUR newsletter, subscribe.

18. HUNTINGTON II NEWSLETTER. College of Engineering. State University of New York at Stony Brook, Stony Brook, New York, 11790.

    Develops science simulations under an NSF grant.

19. INFOSYSTEMS, Hitchcock Publishing Company, Hitchock Building Wheaton, Illinois, 60187.

20. JOURNAL OF RECREATIONAL MATHEMATICS, Baywood Publishing Company, 43 Central Drive, Farmingdale, New York, 11735. 4 issues/year/$10.

21. LOGIC NEWSLETTER, P. O. Box 252, Waldwick, New Jersey, 07463.

    "Logic for the truly interested."

22. MODERN DATA, 3 Lockland Avenue, Framingham, Massachusetts, 01701.

23. THE NEW EDUCATIONAL TECHNOLOGY, General Turtle, Inc. 545, Technology Square, Cambridge, Massachusetts, 02139.

    Newsletter of General Turtle, Inc., a company "formed to make available a new educational technology which will permit giant steps towards extending the uses of computers in education."

24. PEOPLE'S COMPUTER COMPANY, 5 issues, $4. Bob Albrecht, DYMAX, P.O. Box 310, Menlo Park, California, 94025.

25. POPULAR COMPUTING, monthly, $12/year. Popular Computing, Box 272, Calabassas, California, 91301.

    Devoted solely to computing problems useful for assigning students.

26. SIGUE BULLETIN FOR COMUPTER USES IN EDUCATION, 6 issues, $6. Association for Computing Machinery, 1133 Avenue of the Americas, New York, New York, 10036.

    Informative publication relating the use of computers to education. Includes reports and technical notes that emphasize design and application of languages and systems in support of instruction and learning. Position statements discussing many different education uses of computing, pertinent news items, reader reactions and abstracts of recent publications.

27. SIMULATION/GAMING/NEWS, 5 issues $4. Simulation/Gaming/News, Box 8899, Stanford University, Stanford, California, 97305.

    Contains news items, articles and discussions.

28. SIMULATION/GAMING/NEWS, Box 3039, University Station, Moscow, ID, 83843. 5 issues/year/$4.

29. SOLOWORKS, Project Solo, University of Pittsburgh, Pittsburgh, Pennsylvania, 16280.

30. TIES TIMELY TOPICS, TIES, 1925 W. County Road, B2, St. Paul, Minnesota, 55113.

    The "inhouse" newsletter for the TIES consortium which serves 30 school districts.

D. LEARNING TO PROGRAM

1. R.L. Albrecht, TEACH YOURSELF BASIC, VOLUME I, Technical Education Corporation, San Carlos, California 1970.

   A self-teaching workbook which introduces the BASIC language capabilities.

2. R.L. Albrecht, TEACH YOURSELF BASIC, VOLUME II, Technical Education Corporation, 1970.

   Presents more advanced BASIC Language capabilities in the same manner as Volume I.

3. Albrecht, Finkel, and Brown, BASIC, John Wiley and Sons, Inc. 605 Third Avenue, New York, New York, 10026, 1973, #3.95.

   A self-teaching text. Suitable for any grade level. Examples are not solely based on math; they are taken from business, social science, humanities, and simple statistics. Self-tests at the end of each chapter. Excellent reviews.

4. T. R. Blakeslee, INTRODUCING BASIC, Software Distribution Center, Digital Equipment Corporation, Maynard, Massachusetts, 01754. $4.95.

   Designed to teach BASIC at the secondary school or college level. Ideal for teachers with little or no computer experience. Each section is clearly developed and contains a wealth of classroom examples, descriptions, and suggested exercises. A good sequel to POPULUTION or MY COMPUTER LIKES ME.

5. J. S. Coan, BASIC BASIC, AN INTRODUCTION TO COMPUTER PROGRAMMING IN THE BASIC LANGUAGE, Hayden Book Company, Inc., New York.

   For high school students. Incorporates programming with mathematics generally studied during or before a course in first-year Algebra and pre-calculus math. Teachers guide available. Useful as a supplementary book or text for course on computer programming.

6. R.A. Crawford and D.H. Copp, INTRODUCTION TO COMPUTER PROGRAMMING. Haughton-Mifflin. Based on a small, imaginary digital computer, the book provides an illuminating introduction to programming.

7. DEC, POPULATION, Educational Products Group (5-2), Digital Equipment Corporaiton, Maynard, Massachusetts, 01754. $2.

   Approaches beginning BASIC with population problems.

8. T.A. Dwyer and M.S. Kaufman, A GUIDED TOUR TO COMPUTER PROGRAMMING IN BASIC, Haughton-Mifflin, 1973.

9. DYMAX, MY COMPUTER LIKES ME, DYMAS, P.O. Box 310, Menlo Park, California, 94025, 1972, $1.19.

   A good booklet for the person who wants to learn BASIC on his own. You need to work at a terminal as you read. Based on a population program.

10. Edu-Pac, INTRODUCTION TO TIME-SHARING AND THE BASIC LANGUAGE, Edu-Pac, Box 27101, Minneapolis, Minnesota, 55427.

    A learning activity package which discusses programming languages and BASIC specifically, as well as time-sharing. It does not instruct students how to write BASIC programs, but there is a list of problems with applications in many disciplines.

11. M. V. Farina, ELEMENTARY BASIC WITH APPLICATIONS, Prentice-Hall, 1970, $8.50.

    For use as test or individual study of brighter students. Interesting problems and programs.

12. W. Y. Gately, and G. G. Bitter, BASIC FOR BEGINNERS, McGraw-Hill Book Company, 1970.

    An excellent book for the person with no experience. Provides adequate background to begin programming. Very readable.

13. Gross, J. L. and W. S. Brainerd, FUNDAMENTAL PROGRAMMING CONCEPTS, Harper and Row, 1972.

    Valuable source book for interesting applications of computers in adverse areas -- library science, archaeology, political science, sports, ecology, education and demography. Chapters on simulation, puzzles and artificial intelligence, BASIC presented and used throughout.

14. Fred Gruenberger, COMPUTING WITH THE BASIC LANGUAGE, Confield Press, 1972, $7.95.

    The subject of this book is computing, and BASIC is the teaching tool. Algebra and trigonometry is a prerequisite for the advanced problems. Access to a time-sharing system is needed to run the examples and practice the problems.

15. HP 2000E: A GUIDE TO TIME SHARED BASIC, Hewlett-Packard 2111 Spencer Road, Richmond, Virginia, 23230, $2.50.

    A reference manual which you will need. Stock No. 02000-90073.

16. HP 2000E: QUICK REFERENCE CARD, Hewlett-Packard, 1872, $1.

    Summarizes commands in card form. Stock No. 5952-4490.

17. L. Hoitsma, BASIC IN TEN MINUTES A DAY, Secondary School Publication, Kiewit Computation Center, Dartmouth College, Hanover, New Hampshire, 03775, $1.

    Provides a good outline of how to actually go about teaching programming to a class. Twelve short lessons. Designed to incorporate hands-on experience.

18. J. G. Kemeny and T. E. Kurtz, BASIC PROGRAMMING, Second Edition, Wiley, 1971, $6.95.

    Written by parents of BASIC. Also contains chapter on debugging and eleven chapters on applications.

19. Kiewit Computation Center, BASIC FIFTH EDITION, Document Center, Kiewit Computation Center, Dartmouth College, Hanover, New Hampshire, 03775, $3.

20. Kiewit Computation Center, BASIC PRIMER, Document Center, Kiewit Computation Center, Dartmouth College, Hanover, New Hampshire, 03775, $.50.

21. Tate F. Lindall, AN INTRODUCTION TO BASIC, A TIME-SHARING LANGUAGE, Cummings Publishing Company, South Street, Reading, Massachusetts, 01867, 1971, $5.25.

    For use as a text or self-study from ninth grade through graduate school. The text is lucid and explicit. An IBM terminal is used throughout which may be unfamiliar with the Hewlett-Packard system.

22. H. A. Maurer and Mr. R. Williams, A COLLECTION OF PROGRAMMING PROBLEMS AND TECHNIQUES, Prentice-Hall, 1972, $6.95.

    A comprehensive collection of programming problems that will supplement books on programming, programming languages, and programming techniques. Problems range from easy to hard and without reference to specific languages. A good reference text.

23. MPS/VM Teacher Center, 115 Pick Hall, University of Minnesota, Minneapolis, Minnesota, 55455.

The teletype, $.75 BASIC I, $.75 BASIC II, $.75	Booklets with cartoons that already discuss the teletype and programming.

24. J. Pavlovich, and T. E. Tahan, COMPUTER PROGRAMMING IN BASIC, Holden-Day, 1971.

    Through treatment of BASIC Language. Presents sophisticated and complex problems. Advanced high school and college applications.

25. L. Rosenblatt and Rosenblatt, SIMPLIFIED BASIC PROGRAMMING: WITH COMPANION PROBLEMS, Addison-Wesley, 1973.

    Designed to supplement a calculus or precalculus course. First part of the book presents the BASIC Language with mathematical problems. The remainder of the book presents many excellent problems from math, business, science, economics, etc.

26. J. Sack and Meadows, ENTERING BASIC, Science Research Associates, $4.95.

    Serves as an introduction to the notions of interactive computing. Examples are chosen to serve the needs of those with no previous programming experience.

27. C. J. Sass, BASIC PROGRAMMING FOR BUSINESS, Allyn and Bacon, Inc. 1972.

    For use in formal class, individual study or reference. Wealth of examples, and exercises drawn from business applications.

28. Shah, Saber and Canty, A BASIC WORKBOOK.

    In two parts. First directs reader how to use computer: second contains application of computer to business statistics. (Will be published in Fall 1974).

29. W. F. Sharpe and N. L. Jacob, BASIC, AN INTRODUCTION TO COMPUTER PROGRAMMING USING THE BASIC LANGUAGE, Revised Edition, The Free Press, A division of Michigan.

    Straightforward teaching of BASIC. Most applications are related to simple business problems. Particularly attractive to lay readers.

30. R.E. Smith, DISCOVERING BASIC, A PROBLEM SOLVING APPROACH, Hayden Book Company, 1970.

    Proceeds into advanced programming and contains many good examples of computer applications.

31. R. E. Smith, A VISUAL APPROACH TO BASIC, Control Data Corporation, 1972, $4.75.

    A seven session course of slides and tapes resulted in this book. (See COMPUTER PROGRAMMING USING BASIC in Audio-Visual Section) The Audio-Visual course was synthesized into a text for those who prefer the individual approach.

32. D. D. Spencer, A GUIDE TO BASIC PROGRAMMING, Abacus Computer Corporation.

    A thorough introductory text.

33. TTT Mathematics Laboratory, BASIC STRIPS KIT, TTT Mathematics Laboratory, Patrick Henry Junior High School, Granada Hill, California, 91344, instructions are free.

    An activity for learning to program in BASIC. Teachermate activity kit contains 45 packets of cardboard strips that when assembled properly will be a workable computer program.

34. K. Weissman, SCHOOL BASIC, Kiewit Computation Center Dartmouth College, Hanover, New Hampshire, 03955, $1.

    Beginning text for junior high and senior high. Appendix of suggested problems.

35. K. Wiener and B. Ross, BASIC WORKBOOKS, Lawrence Hall of Science, University of California, Berkeley, California, 94720.

    Set of booklets for elementary and junior high students. Introduces them to the teletype terminal and concepts of BASIC through the FOR....NEXT statement.

AUDIO VISUALS

36. LEARNING BASIC VIA OVERHEAD TRANSPARENCIES, Educational Products Group, Digital Equipment Corporation, Maynard, Massachusetts, 01754, $50.

    Includes teacher's guide which provides step-by-step guidelines for teaching beginning BASIC programming course. (Designed for use with Digital equipment, may be slight changes for our system).

37. Movies for learning BASIC programming. 16mm film or 8mm cassetts. Viewer's guides and programmed instruction workbooks. Courses are modular so course may be adapted to your needs. Edutronics, Lakeside, 3345 Wilshire Boulevard, Los Angeles, California, 90070.

38. COMPUTER PROGRAMMING USING BASIC, 35mm slides and audiotapes. Seven one-half hour units. Each unit presents some problem with which the BASIC statements are presented. Shows types of problems. Mrs. Leah King, Control Data Corporation, Box I, HQRC2E, Room 2005, Minneapolis, Minnesota, 55440, $225.

39. Videotapes, (3), Herbert W. Ware, Arlington Public Schools Arlington, Virginia, 22207.

    Two tapes deal with the skills related to programming in BASIC; the third deals with skills needed for using a teletypewriter as a time-sharing computer terminal. Student-response sheets are used in conjunction with the viewing. For use on one half-inch Sony videotape recorders.

E. MATHEMATICS

1. R.L. Albrecht, ADVANCED PROBLEMS FOR COMPUTER MATHEMATICS. Digital Equipment Corporation, Software Distribution Center, Building 1-2, Maynard, Massachusetts, 01754, $2.

   75-page college-like set of mathematics problems. Outstanding collection of problems. Recommended for senior high and junior high.

2. R.L. Albrecht, E. Lindberg and W. Mara, COMPUTER METHODS IN MATHEMATICS, Addison-Wesley, 1969.

   One of the first books written for high school level. Mathematics involved can be understood by anyone with one year of Algebra. Three types of computing languages are used of which BASIC is the main one. Computer science information is included as well as beginning programming.

3. R. Ashley, BACKGROUND MATH FOR A COMPUTER WORLD, John Wiley and Sons, 1973, $3.95.

   A self-teaching guide to fundamental mathematical knowledge required for further study of computer science.

4. K. P. Bogart and M. R. Vitale, THE CALCULUS OF POPULATION, Kiewit Computation Center, Dartmouth College, Hanover, New Hampshire, 03755.

   Informal applications-oriented introduction to the theory of calculus which incorporates the use of the computer as a problem solver. Supplementary text for elementary functions or introduction to calculus.

5. J. Brugate, G. Bryson, RESOURCE PROBLEMS FOR COMPUTER MATHEMATICS, Curriculum Division, Portland Public Schools, 631 NE Clackamas, Portland, Oregon, 97208, $4.

   Contains a list of computer problems and a BASIC program solution and printout for each. Useful to high school teacher as a source of problems. Eleven areas covered are:

   Elementary Equations, Inequalities and Beginning BASIC Problems
   Number Theory
   Quadratic and Polynomial Functions
   Geometry
   Graphic

Trigonometry
Sequence and Series
Systematic Counting, Probability and Statistics
Finance
Matrices and Determinants
Topics in Elementary Calculus

6. P. Calter, PROBLEM SOLVING WITH COMPUTERS, McGraw-Hill, 1973, $5.95.

   Designed for engineering students. First half of book discusses problem solving, algorithms, flowcharts, loops and subroutines. Latter half is devoted to mathematical methods for computers.

7. Colorado School Computing Science Curriculum Development Project, A SECOND COURSE IN ALGEBRA AND TRIGONOMETRY, Prof, Boulder, Colorado, 80302, $4.($5. with three ring vinyl binder).

   Computer concepts have been integrated directly with the mathematics throughout the text. Each reinforces the other. No attempt is made to develop exceptionally proficient programmers, but rather to introduce computer concepts and techniques that will strengthen the understanding of mathematics.

8. Computer Assisted Mathematics Program (CAMP), Scott, Foresman and Company.

   FIRST COURSE, L. L. Hatfield (7th grade)
   SECOND COURSE, J. W. Walther (8th grade)
   ALGEBRA, D. E. LaFrenz
   GEOMETRY, D. W. Katzman
   INTERMEDIATE MATHEMATICS, T. E. Kieren (11th grade)

   Supplementary computer mathematics textbooks. To acquaint students with problem-solving aspects of the computer in regular mathematics schoolwork. Treatment of each topic is thorough, so it is possible to replace chapters in a standard text with this series.

9. Computer-Oriented Mathematics Committee, COMPUTER ORIENTED MATERIALS, County School Board of Arlington, Virginia, 1969.

   A collection of computer applications, mainly mathematical.

10. Computing and Mathematics Curriculum Project (CMCP), (Titles listed below), Dr. Ruth I. Hoffman, CMCP, c/o Mathematics Laboratory, University of Denver, Denver, Colorado, 80210.

Each manual deals with one topic of mathematics and integrates its study with BASIC programming. $1. each.

Topics for Secondary Math:

Quadratic Equations
Polynomials
Analysis of Critical Points of Polynomial Functions
Area under a Curve, Logarithms, and Exponents
Systems of Equations
Lattice Points in a Circle
Circular Functions
Complex Numbers
Natural Bases for Logarithms

Topics of Calculus:

Introduction to the Integral
Techniques of Numerical Integration
Numerical Solutions to Differential Equations

11. CRICISAM, Center for Research in College Instruction of Science and Mathematics, CALCULUS -- A COMPUTER-ORIENTED PRESENTATION, W. Stenberg and R. J. Walker, CRICISAM, Department CCOP, 212 Diffenbaugh, Florida State University, Tallahassee, Florida, 32306, $8.

First chapter contains an introduction to computing via algorithms and flowcharting. There is no material on specific programming languages allowing the teacher to use whatever computer facilities are available. Ideas are introduced and motivated through computer concepts which resulted in a reordering of some topics and at times radical changes in the statement and proofs of theorems. Authors point out that course is somewhat more rigorous than may be appropriate for beginning calculus course.

12. Dartmouth College Materials, Kiewit Computation Center, Dartmouth College, Hanover, New Hampshire, 03855.

Teaching Supplement #1: NUMBER THEORY, $1.50
Teaching Supplement #2: ELEMENTARY STATISTICS, $1.50
Teaching Supplement #3: STATISTICS, $1.50
Teaching Supplement #4: LOGIC, $1.50
Teaching Supplement #5: LINEAR ALGEBRA, $1.50

SUGGESTIONS FOR PROGRAMS, J.H. Danver, THE ELEMENTARY FUNCTIONS: AN ALGORITHMIC APPROACH. Text assumes that the student will have a knowledge of BASIC and access to a computer on a regular basis.

COMPUTER USE IN GENERAL MATH COURSE, A. Waterhouse. Four part course for students which guides them through teletype usage, flowcharting, studies of factors, primes and multiples, simulations and games, and truth sets of equalities and inequalities.

ORBITAL MECHANICS, J. Dalton. Exploration of physical forces in orbital flight. Good application of trigonometry and analytic geometry.

13. Digital Equipment Corporation, Direct Mail Department, Maynard, Massachusetts, 01754.

PROBLEMS FOR COMPUTER MATHEMATICS, R. Allison, $1.25
BASIC APPLICATION PROGRAMS -- MATHEMATICS I, $1.
BASIC APPLICATION PROGRAMS -- MATHEMATICS II, $1.
BASIC MATRIX OPERATIONS, $1.
HUNTINGTON I APPLICATION PROGRAMS -- MATHEMATICS, $2.
ADVANCED PROBLEMS FOR COMPUTER MATHEMATICS, $2.
75-page booklet of problems designed to challenge the average and above-average student. Topics included from general math, algebra, geometry, statistics and mathematical analysis.

COMPUTER-AUGMENTED CALCULUS TOPICS, $1.50
40-page booklet written by Project Solo at University of Pittsburg. Topics include integration, differentiation, limits, etc.

14. M. Dolciani, W. Wooton, and E. Beckenback, ALGEBRA, Haughton-Mifflin Company, 1974.

A new Algebra text that has a section, Programming in BASIC, at the end of each unit. Sample programs relate directly to the material in the unit and new programming concepts are introduced as needed.

15. W.S. Dorn, G.G. Bitter, D.L. Hector, COMPUTER APPLICATIONS FOR CALCULUS, Prindle, Weber and Schmidt, Inc.

Designed for use in conjunction with a standard text. Emphasizes computer applications and presents problems in BASIC and FORTRAN. Also contains a cross-reference topical matrix for fifteen of the most widely used calculus texts.

16. Thomas A. Dwyer and Margot Critchfield, COMPUTER RESOURCE BOOK - ALGEBRA, Haughton-Mifflin, 1973.

Begins with a simple explanation of commands and statements in BASIC language. Twelve units focus on major topics of first year algebra.

17. A. Gorsythe, E. Organick, R. Plummer, COMPUTER SCIENCE PROJECTS AND STUDY PROBLEMS, John Wiley and Sons, Inc., 1973.

18. F. Gruenberger, G. Jaffray, PROBLEMS FOR COMPUTER SOLUTION. Thirteen main projects as well as several hundred problems relating to COMPUTER SCIENCE: A PRIMER AND COMPUTER SCIENCE: A FIRST COURSE. John Wiley and Sons, Inc., 1965, $5.95.

    Contains 80 interesting problems and hints on how to solve them. Recommended for enterprising high school students and computer clubs. Methods are discussed primarily with flowcharts leaving discussion pretty much language free.

19. W. Hamming, CALCULUS AND THE COMPUTER REVOLUTION, Haughton-Mifflin, 1968. Covers a number of numerical methods which apply to algebra and calculus concepts making it a useful handbook for anyone interested in integrating computing into their mathematics courses. Includes some student exercises.

20. D. Hestwood, and E. Orf, COMPUTER CONVERSATIONS (SPEAKING IN BASIC), The Math Group, 5625 Girard Avenue South, Minneapolis, Minnesota, 55419, $3.

    A collection of computer problem cards, illustrated with cartoons. Appropriate for junior and senior high school students who have some familiarity with BASIC. Teacher guide available for $2.

21. HP Computer Curriculum Series, Hewlett-Packard Company, 1972.

    FUNCTIONS, E.A. Herber, $1.

    Attacking Non-linear Equations, $2.50
    Number Sets, $1.
    Mathematical Systems, $1.
    Linear Equations and Systems, $1.

22. L. Carl Leinbach, CALCULUS WITH THE COMPUTER: A LABORATORY MANUAL, Prentice-Hall, 1974, $4.95.

    Excellent adjunct to a computer-oriented calculus course. The book itself is relatively language free, but has appendices in BASIC and FORTRAN.

23. Mark I Time-Sharing, Altoona Area School District, Altoona, Pennsylvania. Designed to supplement standard text and assumes knowledge of BASIC.

    Algebra I
    Algebra II
    Trigonometry

24. Nuffield Mathematics Project, PROBLEMS-RED SET and PROBLEMS-PURPLE SET, John Wiley and Sons, 1970.

    Sets of problem cards appropriate for junior high students. Many of the problems lend themselves to computer use.

25. Oregon State University Computer Materials Project, (titles listed below), Computer Center Publications Clerk, Computer Center, Oregon State University, Corvallis, Oregon, 97331.

    THE CORE PACKAGE: SELF-LEARNING PACKAGE FOR COMPUTER PROGRAMMING USING A TIME-SHARING TERMINAL, $1.50, R. Pinneo. Useful for the very beginner who needs to develop a feel for programming and using a computer. Not a substitute for a BAISC manual though it does include BASIC.

    A RESOURCE SET: COMPUTER PROGRAMS IN MATHEMATICS FOR SECONDARY SCHOOLS, C. Geldaker, $1.50. Eight sets of student exercises listed below:

    Ratios and Proportions (Geometry)
    Similar Triangles (Geometry)
    Pythagorean Thaorem (Geometry or Algebra II)
    Distance Formula (Geometry or Algebra II)
    The Circumference of a Circle (Geometry or Algebra II)
    Area of a Circle (Geometry, Algebra II or Advanced Math)
    Definition of the Circular Functions (Algebra II or Adv. Math)

26. PROJECT SOLO COMPUTER TOPICS, Computer Curriculum Project, Hewlett-Packard Data Systems Division, 11000 Wolfe Road, Cupertino, California, 95014.

    TRIGONOMETRY, $3.50
    Provides a chance to write and use programs to solve trigonometry problems and explore some aspects of trigonometry functions difficult to get at without the aid of the computer.

    MATRIX MATHEMATICS, $3.50
    Could be used as a short text. Problems are interesting, relevant, and fun.

MATHEMATICS PROJECTS, $3.50
Eight possible projects in the area of Lagrangian Interpolation/Extraoplation, Distance and Error-correcting codes, Enumeration, and Sketching Graphs of Functions.

CALCULUS, $3.95
Provides students with computer exercises for four of the fundamental concepts behind calculus - limits, approximating areas, numerical integration, Fundamental Theorem of Integral Calculus.

27. S. Rogowski, PROBLEMS FOR COMPUTER SOLUTION, order from Mr. Stephen Rogowski, 6 Edward Street, Choes, New York, 12047.

    Ninety creative problems, mostly oriented toward mathematics. Each problem is followed by a sample BASIC program. 350 pages. Teacher's Guide, $1. Student Guide, $1.25 (Include $.50 for postage).

28. School Mathematics Project, FROM PROBLEM TO PROGRAM, Cambridge University Press.

    Introduction to programming at a simple level. Suitable for programming course. Junior and senior high level.

29. Smith, R.E. COMPUTER EXPLORER SERIES IN FORTRAN AND BASIC, Control Data Corporation, 1970, $3. each (less if several are ordered).

    Provides suggested topics of study in depth for those with background in programming.

    TITLES NOW AVAILABLE

    Biorhythm Theory
    Interest in Money
    Primes and Factors
    Factorials
    Random Numbers
    Population Holocaust
    Excursion in Astrology
    A Look at Numerology
    Distances - Here to There
    Game Theory
    Statistical Procedures
    Your Handwriting Palm Reading
    Bid Arithmetic
    Sorting Data
    Metrology
    Visual Elements
    Linear Programming
    Simulated Gaming

30. Carol S. Shingles, A COMPUTER GUIDE FOR A SEMESTER COURSE IN COMPUTER MATHEMATICS, EDINET Instruction Series, Vol XIX, Honeywell, Inc.

    Part of this book is devoted to a collection of computer problems and games.

31. Silver Burdett Mathematics Series: Standard high school texts containing computer applications. End of each chapter contains optional section in flow charting and computers, relating to chapter. BASIC.

ALGEBRA I, B.R. Vogeli, F.J. Prevost, G.A. Gilbert
E.M. Carroll, C.A. Torell

ALGEBRA II AND TRIGONOMETRY, B.R. Bogeli, H.S. Murdock,
F.T. Prevost, C.A. Torell.

F. SCIENCE

1. Paul Cauchon, TUTORIAL EXERCIXES FOR CHEMISTRY, Software Distribution Center, Digital Equipment Corporation, Building 1-2, Maynard, Massachusetts, 01754.

   Teacher's Resource Guide, $2.75. Student Workbook, $1.

   Examines ten of the common topics taught in introductory chemistry courses. Well suited for exercises, remedial work or pre-exam review material.

2. Michael Chester, GRAZE Ecology Simulation, Computer Curriculum Project, Hewlett-Packard, 11000 Wolfe Road, Cupertino, California, 95014, Student Text, $3.50, Teacher's Notes $4.

   Students try to attain an ecological balance among the flora and fauna of a few square miles of grasslands. Elements are reduced to a few simple variables - population of cattle, songbirds hawks, rodents and grasshoppers.

3. Commission on College Physics, COMPUTER ORIENTED PHYSICS PROBLEMS, AIP Information Pool, P.O. Box 617, Stony Brook, New York, 11790, 1971. A set of nine problems for use in an undergraduate physics class which can be solved and better understood through the use of the computer. Program listings are in FORTRAN.

4. Educational Research Council of America, COMPUTER SIMULATED EXPERIMENTS, Rockfeller Building, Cleveland, Ohio, 44113.

   PROGRAMS

   MAZLER - simulates maze learning by rodents, $8.
   PHOSYN - simulates plant growth under varying conditions, $8.
   RXRAT 2 - simulates reaction of magnesium with acid in varying conditions, $8.
   PLANMA - a simulation game in which players compete to develop a mythical planet, $9.

   SCIENCE TEACHING WITH COMPUTER SIMULATED EXPERIMENTS, $1.

5. Robert Ehrlich, PHYSICS AND COMPUTERS, Haughton-Mifflin, 1973.

   Illustrates computer application in physics at the beginning and intermediate undergraduate levels. Contains selected problems in electricity, waves and modern physics, as well as an introduction to computers, flowcharts and FORTRAN IV. Also cross-referenced to 24 of most popular introductory physics texts.

6. G.F. Estabrook, AN INTRODUCTION TO ENVIRONMENTAL MEASUREMENT AND ITS DESCRIPTIVE ANALYSIS BY COMPUTER, Kiewit Computation Center, Dartmouth College, Hanover, New Hampshire, 03755.

   A guide to methodology in investigation of environmental variation. Based on contention that method is learned through its practice.

7. Hewlett-Packard Computer Curriculum Series, HP, 11000 Wolfe Road, Cupertino, California, 95014.

   GEOMETRICAL OPTICS, Student Lab Book, $1., Teachers Advisor, $1.
   MECHANICS, Student Lab Book, $1.
   WAVES, Student Lab Book, $1., Teachers Advisor, $1.
   ELECTRICITY AND MAGNETISM, Student Lab Book, $1., Teachers Advisor, $1.
   AIR POLLUTION, Student Lab Book, $1., Teachers Advisor, $1.

8. Huntington I Computer Project Materials, Software Distribution Center, Digital Equipment Corporation, Maynard, Massachusetts, 01754.

   EARTH SCIENCE, (4 programs), $1.
   BIOLOGY, (7 programs), $1.
   CHEMISTRY, (12 programs), $2.
   PHYSICS, (21 programs), $2.
   SCIENCE, (9 programs, mostly Physics), $1.

9. Huntington II Computer Project Materials, Software Distribution Center, Digital Equipment Corporation, Maynard, Massachusetts, 01754.

   Each of the following programs are simulations accessible in the system library. Accompanying manuals for each are: Student Manual $.30, Teachers Commentary, $.30, Resource Manual, $.50.

   BIOLOGY
   GENE 1, A computer simulation of the inheritance of genetic traits for a varying number of offspring demonstrates the statistical nature of the Mendelian Laws.

   LOCKE4, Designed to allow the student to apply his class knowledge of the lock and key model of enzyme specification in a simulation of a real biochemical investigation.

   MALAR, Allows the user to attempt to control a malaria epidemic. Provides a context within which to study the biological, economic, social, political, and ecological aspects of a classic world health problem.

POLOT, Interaction between water and waste is simulated on the computer, providing a context within which the user can control specific variables which affect the quality of a water resource.

STERL, Designed to make possible an investigation of the effectiveness of two very different methods of pest control:

1. the use of pesticides
2. the release of sterile males, whether used singly or together in an integrated program.

TAG, Provides students with an opportunity to investigate the size of a wildlife population through the technique of tagging and recovery. The large-mouth bass population of a simulated farm pond is used as the study species.

PHYSICS

CHARGE, This simulation of a modern version of the millikan oil drop experiment is designed to demonstrate to the student the existance of a discrete unit of electrical charge.

SLITS, The classic experiment demonstrating interference patterns for light is simulated on the computer allowing greater flexibility for variation and investigation of parameters.

(NOTE: Several other simulations are still under development and will be added to system library so they are made available.)

10. J.L. Jones, PHYSICS TUTORIAL PROBLEM WORKBOOK, Kiewit Computation Center, Dartmouth College, Hanover, New Hampshire, 03755.

    Designed for use with a computer terminal. Fifty tutorial problems and related diagrams are designed to augment instruction in undergraduate general physics - mechanics, electricity, and magnetism.

11. Project SOLO Computer Topics, HP Computer Curriculum Project, 11000 Wolfe Road, Cupertino, California, 95014.

    PHYSICS, Student text, $3.50, Teachers guide, $3.50.

12. Project SOLO, PHYSICS, Computer Curriculum Project, Hewlett-Packard Data Systems Division, 11000 Wolfe Road, Cupertino, California, 95014, $3.50.

    Combines tutorial programs with student written programs to study the physics topics of the MKS System of Measurement, Newton's Laws, and some aspects of Optics.

G. GAMES

1. C.C. Abt, SERIOUS GAMES, The Viking Press, Inc., 625 Madison Avenue, New York, New York, 10022. Presents an agreement for game playing and simulations as an educational experience. Lots of ideas for games in education, social and physical sciences, etc.

2. David Ahl, ed., 101 BASIC COMPUTER GAMES, DEC, Software Distribution Center, 146 Main Street, Maynard, Massachusetts, 01754, $5.

   A collection of 101 BASIC games including a description of each game, a listing and a run showing how the program works.

3. David Ahl, GETTING STARTED IN CLASSROOM COMPUTING, Digital Equipment Corporation, Software Distribution Center, Maynard, Massachusetts, 01754, $1.50.

4. David Ahl, UNDERSTANDING MATHEMATICS AND LOGIC USING BASIC COMPUTER GAMES, Digital Equipment Corporation, Software Distribution Center, Maynard, Massachusetts, 01754, $1.50.

   Leads students into writing computer games. It explains how the game works (not the program) and the students write the actual program.

5. Litton Industries, THE BEST OF PROBLEMATICAL RECREATIONS, Volumes 1, 8, 9, 10, Litton Industries, Beverly Hills, California.

6. PCC GAMES (Program Listings), PCC Bookstore, P.O. Box 310, Menlo Park, California, 94025, 1974, $2. Program listings of the computer games presented in back issues of PCC. Uses a standard form of BASIC and Hewlett-Packard strings.

7. E.R. Ranucci, PUZZLES, PROBLEMS, POSERS, AND PASTIMES, Volumes I, II, III, Haughton-Mifflin Company, 1972, $4.45 (paper), $8.75 (cloth).

   Complimentary copies available from publisher. Many of the problems make interesting computer applications.

8. Dale Seymour and Richard Gidley, EUREKA, Creative Publications, P.O. Box 10328, Palo Alto, California, 1967.

   A collection of 253 problems intended for mathematics enrichment. Represents a wide range of difficulty and topics.

9. Robert E. Smith, THE BASES OF FORTRAN, Control Data Corporation, 1967.

10. D.D. Spencer, GAME PLAYING WITH COMPUTERS, Spartan Books, 1968.

11. C.R. Wylie, Jr., 101 PUZZLES IN THOUGHT AND LOGIC, Dover Publications, Catalog No. T367, $1.

    Many of the puzzles preserted would make interesting and fun computer applications.

12. D. Zuckerman and R. Horn, THE GUIDE TO SIMULATIONS/GAMES FOR EDUCATION AND TRAINING, Information Resources, Inc., P.O. Box 417, Lexington, Massachusetts, 1973, $15.

    Extensive reference of 600 games and simulations for educational use.

13. E. Sage, FUN AND GAMES WITH THE COMPUTER, Entelek, 1974, $5.95.

    No math required. Readers learn the BASIC Language in the process of programming the computer to play games.

H. CLUBS

1. AEDS, COMPUTER CLUB INFORMATION KIT FOR SCHOOLS, Association for Educational Data Systems, 1201 Sixteenth Street, N.W., Washington, D.C., 20036, $1.

   Gives objectives and suggested activities for a student computer club. Also includes a list of interesting problems for computer solution.

2. National Computing Center, Ltd., COMPUTER CLUBS, International Publications Service, 114 E. 32nd Street, New York, New York, 10016.